APPLICATION

COASTAL NONPOINT SOURCE POLLUTION GRANT PROGRAM

FY 2006

Request for Responses: ENV 06 CZM 02

Name of Applicant:	Town of Duxbury
Contact Information	
Name:	Joseph Grady
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Address:	Town Hall 878 Tremont Street Duxbury, MA 02332
Project Title:	Kingston Bay Assessment
Amount Requested:	$21,420
Match Amount:	$ 7,160
Total Project Cost:	$28,580

Project Summary (briefly describe the proposed project in one or two short paragraphs):

The proposed project represents the first phase of what is envisioned as a multi-phased approach to reopening over 1000 acres of shellfishing area in Kingston Bay to year-round use. Known to DMF as CCB43, the 1252 acre shellfishing bed is classified as "Approved" on only about 140 acres in Duxbury. By this Assessment study, the Town begins the process of identifying stormwater discharges into the Bay from Bay Road and other surrounding roads on Captains Hill contributing to "The Nook" and the Bay. The work will include review and verification of a 1972 stormwater report for the Town; field survey to update and map the system in the subject area; water quality data review and supplemental sampling; conceptual design of BMPs to mitigate the problem; and a Report to document work and prioritize follow-up activities.

The Town of Duxbury will provide in-kind services to achieve its 25% share as a project match. The services of the DPW Superintendent and the Conservation Administrator, both of whom are

experienced in CPR work through the recent construction in Snug Harbor (Duxbury) are expected to be provided. In addition, the Town, under a structured water quality sampling program, will provide the services of a sampler during rain events, and a certified laboratory for analysis. Other work will be provided by a Consultant who will be retained by the Town and paid for from funds in the Grant request.

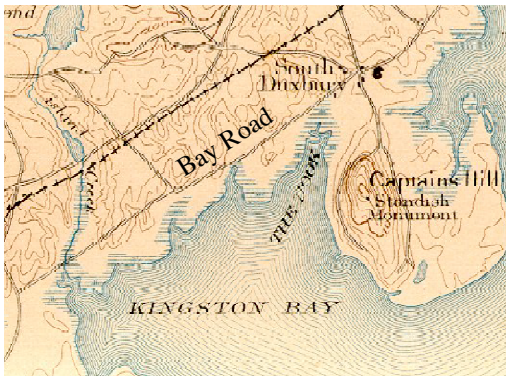
1) Describe the known or perceived sources of NPS pollution, the pollutants of concern, and the natural resources and/or recreational uses adversely affected by the pollution problem. What are the receiving waters and Massachusetts coastal waters of concern? Provide a clear and legible map that shows the receiving water of concern, its watershed (drainage area), and its position in the Massachusetts Coastal Watershed. Provide supporting material, such as water quality data, land use patterns and trends, resource classifications or other management information, and observable impairments. Is this problem a statewide priority?

Known/Perceived Sources of Pollution

Kingston Bay and "the Nook" (a subarea of the Bay) represent a rich potential source of shellfishing to the residents of Duxbury. The Bay is bordered by Bay Road to the northwest, and by roads on the Captains Hill peninsula to the northeast. This roadway network represents the known and perceived sources of NPS pollution in the planning area.

Bay Road is a paved, two-lane town road, approximately 10,000 feet in length, running along side Kingston Bay from the Kingston town line north to the village of South Duxbury. The Captain's Hill peninsula, meanwhile, is comprised of two historic roads: Standish Street and Crescent Street which have, in turn, spawned other roadways that drain into the Bay. Bay Road, Standish Street, and Crescent Street have been in existence for over a hundred years and have been rebuilt and repaved often to accommodate rising traffic demands. USGS maps as far back as 1893 show the roads to exist, with no structures except for a few buildings in South Duxbury. By 1941, the area served by Bay Road and Captains Hill had been subject to significant increases in the number of homes as development moved south.

Figure 1 below illustrates the early characteristics of the roadway network in Duxbury surrounding Kingston Bay and "the Nook".



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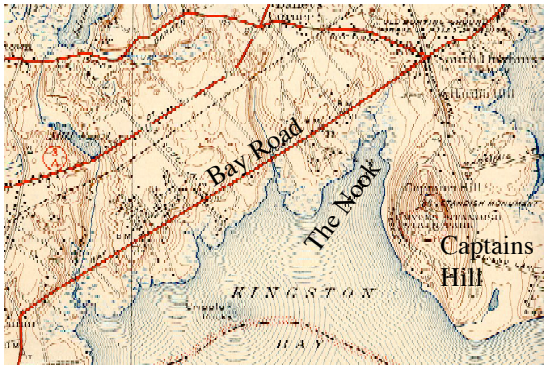


1941

FIGURE 1
Bay Road in 1893 and 1941
USGS Mapping

Natural Resources/Recreational Uses

As noted above, Kingston Bay is an area rich in shellfish flats exposed twice each day with the tide. Identified as Growing Area CCB43 by the Division of Marine Fisheries, the flats are subdivided into four parcels (CCB 43.1, CCB 43.2, CCB43.3, and CCB43.4) which, collectively, provide 1252 acres of potential shellfishing area. [Note: DMF Survey data used by the Town is dated August 2002 and, as such, is more current than that available at the DMF website which shows only three parcels]. CCB43.1 (Ichabod Flats), the smaller of the four parcels at about 140 acres, is "Approved" for shellfish harvesting. The balance, some 1112 acres, is classified as either "Conditionally Approved-Rainfall amount 0.3" or less" (CCB43.3), "Restricted" (CCB43.4), or "Prohibited" (CCB43.2). It should be noted that the Town has struggled to enable CCB43.1 to be opened by taking appropriate actions to bring local Title V systems up to current standards, and by eliminating cross connections of failed systems into the public drainage network. By the actions to be initiated under this NPS Application, it is hoped to raise the classification of CCB43.3 to "approved" and the Duxbury side of CCB43.2 to "conditionally approved". Figure 2 below illustrates the natural resources of concern and the appropriate classification.

In addition to shellfishing areas, the Island Creek estuary of Kingston Bay is the site of another natural resource: an active osprey nesting area. Installed in the late 1980's, the osprey can be seen from Bay Road in their nest located on the Hicks Point Road pole. From their perch they patrol Island Creek, the only anadromous fish run in Town. Since 2001, the osprey have been "banded" to enable better tracking of the movements of this magnificent aerial predator. To complement the osprey, the Town has been working with federal officials to restore the bird in even greater numbers.

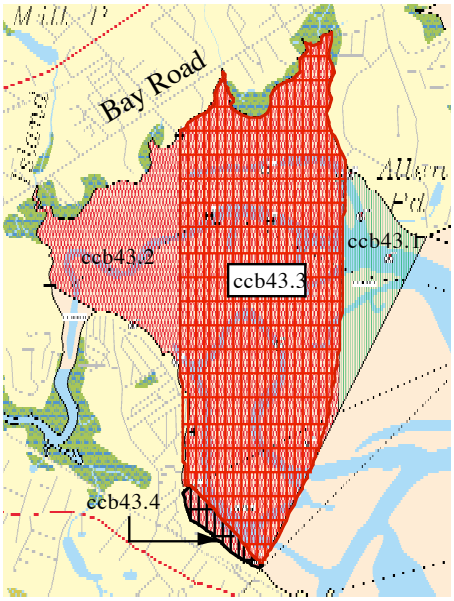


Figure 2
Shellfish Bed CCB43
Division of Marine Fisheries

The entire Town of Duxbury drainage system, including that existing on Bay Road and flowing into CCB43, was studied in 1972 and concluded with a preliminary report entitled "Master Drainage Report". Within the Report, Drainage Area 11 was identified as contributing flow to coastal areas of the Town, including Kingston Bay. A townwide map was produced at 800 scale depicting the location and characteristics of all existing drainage structures. At-grade elevation, invert elevations, and other details were presented. Many drainage components were identified in the Report to be inaccessible or inadequate to meet runoff demands. Meanwhile, a brief visit to the area in preparation of this Application reveals that many new drainage components such as catch basins, manholes, outfall pipes, and other structures, have been installed since 1972.

The goal of the Town of Duxbury is to mitigate pollution of CCB43.3 and CCB43.2 so that the entire shellfishing area bordering the Town can be reopened to the public. As such, the sources of NPS pollution are believed to include stormwater runoff at a variety of points into the Bay which bring with it fecal coliform bacteria resulting in the bed closures. To accomplish the goal, the Town proposes to undertake this Assessment to better understand the existing drainage system, and to identify and prioritize the sources of contamination for further attention consistent with stormwater BMP technology.

Figure 3 depicts the receiving water of concern, its watershed (drainage area), and its position in the Massachusetts Coastal Watershed.

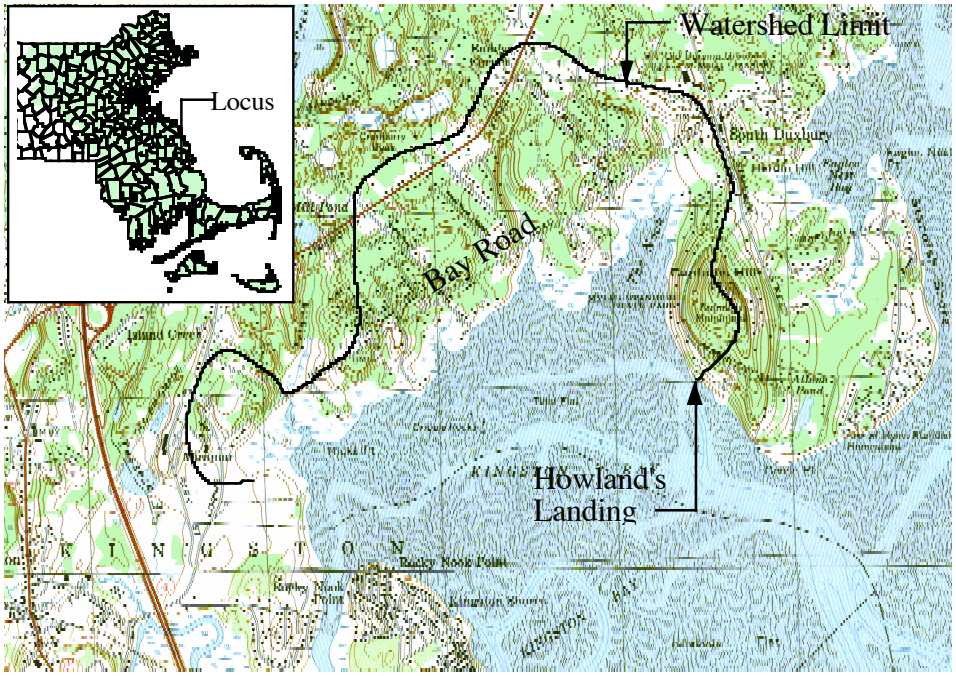


Figure 3
Watershed Area
USGS Mapping (Mass GIS)

2) Explain the goals and objectives of the proposed project, the extent of the project, and how the project will address the NPS pollution problem. Clearly describe the specific steps to be taken (i.e., scope of work), and the deliverables to be completed. Include an estimated cost associated with each task, a project timeline, and identify staff that will be working on the project. For stormwater assessment projects, provide an overview of the proposed assessment and the quality assurance protocols to be implemented. **For structural demonstration BMPs, engineering plans (stamped by a Professional Engineer) and a statement regarding operation and maintenance commitments for the proposed structure, including the anticipated maintenance schedule, must be provided.**

GOALS AND OBJECTIVES

As stated above, the goal of the project is to upgrade shellfish bed ccb43.3 to "Approved" from "Conditionally Approved", and ccb43.2 in Duxbury to "Conditionally Approved" from "Prohibited". We understand, however, that good things may need to come in small steps and so we have prioritized our goals to those which we believe are achievable. Goal 1 is to take the stormwater mitigation steps necessary to move the ccb43.1 line westerly from its current terminus at Howlands Landing to include all of ccb43.3. Such movement would open up "The Nook" to shellfishing. A second goal is to enable ccb43.2, at least in the Duxbury side, to be declared "Conditionally Approved" so that it might be open in the winter and other cold months.

The objective of this Assessment is to update our understanding of the storm drainage system contributing flows to ccb43.2 and ccb43.3 in Duxbury, and to develop a plan of action consisting of specific stormwater BMPs that will address stormwater runoff. The plan of action, and all supporting documentation, will be presented in an Assessment Report that can be used by the Town for any future work, funded under CPR or otherwise, in the step-by-step process of recovering the natural resource that is Kingston Bay.

PROJECT EXTENT

The extent of the project consists of the entire watershed contributing flow to Bay Road in Duxbury, approximately 570 acres over a distance of 10,800 feet, plus the watershed on Captains Hill draining to "The Nook" east to Howlands Landing (approximately 90 acres). Figure 3, above, shows the project area limits. Island Creek, a separate drainage area that flows into the Bay, is not considered for review at this time but may be subject to future assessment if sampling suggests that Creek flows at the Bay Road culvert are contaminated. No work is planned in the neighboring town of Kingston.

PROJECT APPROACH

Work performed under the proposed assessment will make maximum use of data gathered as part

of the 1972 Report by Weston & Sampson Engineers, Inc and already plotted at 800 scale. Additional work will include 1) area-wide drainage system inspection to update the map with new or removed drainage structures, and to identify outfalls, 2) topographic survey of all catchbasins and drain manholes to reflect changes over the past 33 years, 3) preparation of a formal 200 scale map showing the existing storm drain system and the subdrainage areas to include pipe inverts and pipe diameter, 4) gathering historical and new water quality data; 5) review of subsurface soils characteristics; 6) assessment of hydraulic characteristics and first flush volumes; 7) preparation of conceptual design plans and and estimated construction cost for each to be used as planning tools for a future Phase 2 CPR Grant Program application, and 8) preparation of a written report describing all activities undertaken and presentation of deliverables (e.g., maps, tables of data, conceptual design plans to scale, and construction cost estimates). Specific tasks are as follows:

SCOPE OF WORK

Task 1 - System Inspection

The Town will provide one staff member who, accompanied by a contracted professional engineer, will traverse the watershed area to locate any drainage structures and outfalls not mapped earlier. The field team will also confirm or deny the existence of structures previously mapped.

Task 2 - Conduct Selected Topographic Survey

A topographic survey will be performed on key components of the drainage system to determine relative locations, at-grade elevations, and pipe invert elevations to enable refinement of the knowledge base. The results of the survey will be plotted at 200 scale.

Task 3 - Prepare Stormwater System Map

Using a suitable town map such as the local composite zoning map as a base map, the surveyed information describing the existing storm drain system will be added. Pipe diameter and invert elevation will be shown, and all catchbasins and manholes will be connected as they are in the field to form a complete plan of the subject stormwater drainage system. Roadway subdrainage areas will be delineated by outfall based upon the mapped information and USGS topographic contours, and calculations performed to determine the amount of impervious area, total drainage area, and "first flush" volume.

Deliverable: Map of system at the appropriate scale (expected to be 1"=200') depicting all existing drainage systems in the watershed impacting Kingston Bay from Bay Road and the Captain's Hill peninsula west of Howland's Landing.

Task 4 - Review Sources of Water Quality Sampling Data

The Town will provide staff to research local Board of Health data that may have been gathered

as part of the process to enable the public beach off Landing Road to remain open. In addition, the files of the Division of Marine Fisheries will be searched with respect to CCB43 and any relevant data obtained, compiled, and analyzed.

Task 5 - Perform Water Quality Sampling

During two wet weather events, the Town will provide staff to sample at selected outfalls. The samples will be brought to a laboratory regularly used by the Town Board of Health. G&L Labs, Inc. of Quincy is certified to analyze for fecal coliform, enterococci, total coliform, COD, and total suspended solids. Results of the analysis will be tabulated and used in the process of establishing a priority for future grant applications.

Task 6 - Subsurface Investigation

Review Board of Health information for test pit results at residences near possible future subsurface disposal systems. Also, consult the Soils Survey Mapping available through the USDA-NRCS.

Task 7 - Determine Hydraulic Characteristics

Using the appropriate hydraulic models, estimate "first flush" volumes and stormwater flows under the specific storm events (e.g., 10-year, 24-hour storm) for each subdrainage area. Tabulate the results.

Task 8 - Prepare Conceptual Design Plans

For each outfall-based subdrainage area a conceptual design will be developed that is consistent with BMP guidelines for retrofitting existing systems. The designs will be based upon systems that achieve fecal coliform removal and, as such, will seek to discharge the first flush to percable soils. Although TSS removal is needed ahead of such a system, TSS removal is not the Town's goal. Based upon the conceptual design, an estimate of construction cost will be made using materials quantities derived from the design and unit prices obtained from recent similar work in Duxbury.

Task 9 - Prepare Written Report

A brief report will be prepared that summarizes all work, both field and office, that was undertaken for the project. Included will be narrative discussion of all findings, and tables and figures as needed to best illustrate how the storm drain system functions. The 200 Scale map developed above will be presented, and conceptual designs to scale appended along with construction cost estimates. Using these data, a ranking of the subdrainage areas will be developed based upon size of drainage area, water quality data, level of understanding of the subbasin system, and feasibility of installing a BMP that can mitigate fecal coliform impacts. The BMP designs will be based upon systems that remove TSS, oil and grease, floatables, and fecal coliform. Systems for non-fecal removal may include settling tanks, special water quality inlets, and settling basins. Systems for fecal removal may include subsurface infiltration systems and

constructed or restored wetlands. The report will also recommend a step-by-step program for design and construction of BMP components to be consulted for future implementation to mitigate stormwater pollution of CCB43 in Kingston Bay.

Deliverable: Five copies of a Draft Final Report for review by Town and CZM staff. Upon responding to comments, five (5) copies of the Final Report to the Town and CZM staff.

Task 10 - Administration

This is a Town of Duxbury task only, to keep the appropriate records of staff and administrators to comply with the monitoring requirements of the Commonwealth under the subject grant; to prepare quarterly requests for reimbursement to CZM; to procure and manage the subconsultant retained to prepare the work products; and to manage in-house staff assignments for the duration of the Assessment.

PROJECT COST

Table 1 below represents our estimate of the cost by task to complete the work. In summary, we estimate a total project cost of $28,580 of which $23,080 is labor and $5,500 is expenses.

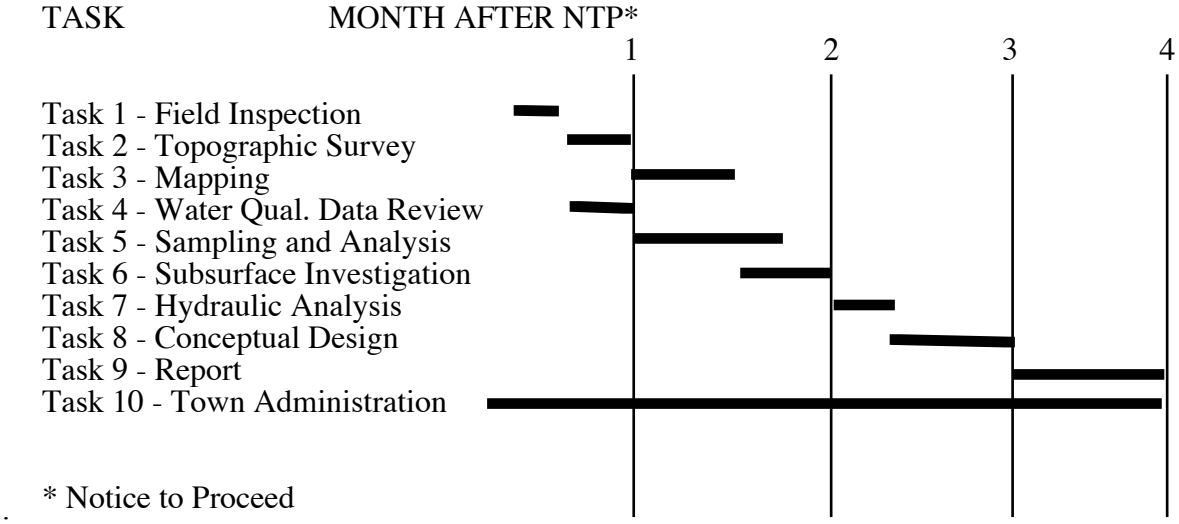
TABLE 1 - COST BY TASK

TASK	TOTAL COST($)
FIELD INSPECT.	1920
TOPO SURVEY	420
STORM MAP	2280
DATA REVIEW	1420
SAMPLING & ANAL.	1160
SUBSURFACE INVESTIGATION	1320
HYDRAULIC ANALYSIS	2160
CONCEPT. DES.	3280
REPORT	6880
TOWN ADMIN	2240
TOTAL LABOR COST	23080
EXPENSES	
laboratory: 12 samples @$150 ea.	1800
survey: 2 days @ $1800 ea.	3600
printing	100
TOTAL EXPENSES	5500
TOTAL PROJECT COST	$28580

PROJECT TIMELINE

Our estimate of time to complete the Assessment is presented in Figure 4 below. As shown, the work will take approximately four months to complete after a notice to proceed. The time frame could shorten depending on the frequency of storm events that will enable sampling of wet weather flow. If so, the project could be completed in three months through a final report

PROJECT SCHEDULE



STAFFING

The Town of Duxbury will utilize the services of a consulting engineer to conduct the study; however the Town will coordinate all work and be responsible for sampling and analysis using town personnel and the nearby laboratory. Mr. Tom Daley, PE, Director of Public Works will be the contact person for the Town. He recently completed a similar effort under CPR'05 to construct the Snug Harbor stormwater mitigation systems on Washington Street. Mr. Joseph Grady, Conservation Administrator, will assist with the coordination of laboratory sampling and analysis. Joe was instrumental in the early stages of planning the Snug Harbor work in 2002 under a EOEA-CZM grant. Staff of both offices are expected to provide incidental labor related to contract administration.

3) Explain how the project will result in clear water quality benefits. How will progress and success be measured (e.g., water quality improvement documented by receiving water quality monitoring and/or monitoring by pollutants captured by installed BMPs)?

The proposed project is an Assessment of stormwater impacts from Bay Road and other roadways on Captains Hill discharging into Kingston Bay from Duxbury. It will not directly result in water quality benefits because no design or construction is planned under this phase of work. As such, no water quality monitoring program has been designed to measure success. The water quality sampling program proposed is intended to enable a quantitative characterization of discharges into the Bay for future planning purposes and to serve as a baseline for future reference. If the Town chooses to go forward with an application under CPR to fund design and construction, it will present a program to measure success at that time.

4) Describe the level of support and coordination for the project. Describe the importance of the project to the municipality (i.e., whether it was it a priority project developed as part of a larger planning process).

The Town of Duxbury has recently successfully completed construction of BMPs in the Snug Harbor section of town to mitigate contamination from road runoff at a single pipe discharge point. That project, which was funded under the CPR program, and the precedent design project funded by EOEA, have energized the community around the ability to secure state funding for projects that can mitigate adverse effects from stormwater runoff. Building upon the recent past, the Town now seeks to develop a planned attack of contamination to Kingston Bay via Bay Road and other roadways in an effort to reopen over 1000 acres of shellfish area.

5) State whether your community is participating in the Commonwealth Capital Program and record your municipality's score. Please provide either the score or write "TBD" if the score has not been determined yet. If the score has yet to be determined, CZM will obtain the score directly from the Office of Commonwealth Development. If the applicant is a non-municipality, please write NA/

The Town of Duxbury is participating in the Commonwealth Capital Program. As of June 10, 2005 the Town of Duxbury scored 71 in the subject program.

6) Explain the proposed budget in detail (grant funds requested and match provided). Discuss all aspects of the match, including both cash and in-kind. CZM will reimburse up to 75% of the total project cost. The grantee will match at least 25% of the total project cost. Local or state money that is not currently being used to match other government programs can be included as match. Costs incurred as a result of application preparation will not be considered as part of the match requirements. The Commonwealth will not be responsible for

any costs or expenses incurred by the applicants responding to this RFR. Cash match spending details must be provided. Cash contributions are those funds that will be used to purchase goods or services associated with the project. In-kind contributions represent the value of non-cash contributions provided by the applicant. In-kind contributions may be in the form of charges for real property and non-expendable personal property and the value of goods and services directly benefiting and specifically identifiable to the project.

Use the template below to provide a detailed, itemized budget breakdown for the funds being requested by proposed task and sub-category (i.e. materials and supplies, personnel, contractual, etc.).

Task 1 Description:	GRANT ($)	MATCH ($)	TOTAL ($)
$_____staff time (indicate hrs. and rate)			
$_____administrative (indicate materials, postage, etc.)			
$_____travel (indicate miles and rate)			
$_____other (specify)			
Task 2 Description:			
$_____staff time (indicate hrs. and rate)			
$_____administrative (indicate materials, postage, etc.)			
$_____travel (indicate miles and rate)			
$_____other (specify)			
Task 3: etc.			
TOTALS	$	$	$

The proposed Assessment is expected to cost a total of $28,580 to include $7,160 of in-kind services (25%) as a project match. Match funds include the labor of a number of town employees plus laboratory analyses at certified town facilities. Table 2 below, designed according to the template presented in your RFR, presents the allocation of funds by task.

TABLE 2
BUDGET FOR 2006

Task 1 Description: Field Inspection		**Hrs**	**Rate**	**GRANT ($)**	**MATCH ($)**	**TOTAL ($))**
Town Staff	DPW Director	8	40		320	320
	Conservation Admin.	8	40		320	320
	Town Staff	8	30		240	240
Administration	Consultant		1040	1040		1040
	materials		0		0	0
	postage		0		0	0
Travel			0			
Task 2 Description: Topographic Survey						
Town Staff	DPW Director	2	40		80	80
	Conservation Admin.	2	40		80	80
	Town Staff	0	30		0	0
Administration	Consultant		260	260		260
	Surveyor		3600	3600		3600
	postage		0	0		0
Travel			0			
Task 3 Description: System Mapping						
Town Staff	DPW Director	2	40		80	80
	Conservation Admin.	2	40		80	80
	Town Staff	0	30		0	0
Administration	Consultant		2120	2120		2120
	materials-backhoe rental		650			0
	postage		0	0		0
Travel			0			
Task 4 Description: Water Quality Data Review						
Town Staff	DPW Director	4	40		160	160
	Conservation Admin.	4	40		160	160
	Town Staff	2	30		60	60
Administration	Consultant		1040	1040		1040
	materials		0		0	0
	postage		0	0		0
Travel			0			

Task 5 Description: Sampling & Analysis						
Town Staff	DPW Director	2	40		80	80
	Conservation Admin.	8	40		320	320
	Town Staff	8	30		240	240
Administration	Consultant		520	520		520
	Laboratory Analysis		1800		1800	1800
	postage		0	0		0
Travel			0			
Task 6 Description: Soils Investigation						
Town Staff	DPW Director	2	40		80	80
	Conservation Admin.	2	40		80	80
	Town Staff	4	30		120	120
Administration	Consultant		1040	1040		1040
	materials		0		0	0
	postage		0		0	0
Task 7 Description: Hydraulic Analysis						
Town Staff	DPW Director	2	40		80	80
	Conservation Admin.	0	40		0	0
	Town Staff	0	30		0	0
Administration	Consultant		2080	2080		2080
	materials		0			0
	postage		0		0	0
Travel			0			
Task 8 Description: Conceptual Design						
Town Staff	DPW Director	4	40		160	160
	Conservation Admin.	0	40		0	0
	Town Staff	0	30		0	0
Administration	Consultant		3120	3120		3120
	materials		0		0	0
	postage		0		0	0
Travel			0			
Task 9 Description: Report						
Town Staff	DPW Director	4	40		160	160
	Conservation Admin.	4	40		160	160
	Town Staff	2	30		60	60
Administration	Consultant		6500	6500		6500
	printing		100	100		100
	postage		0		0	0
Travel			0			

Task 10 Description: Town Administration

Town Staff	DPW Director	24	40		960	960
	Conservation Admin.	20	40		800	800
	Town Staff	16	30		480	480
Administration	Consultant		0	0		0
	materials		0		0	0
	postage		0		0	0
Travel			0			
		TOTALS		$21,420	$7,160	$28,580
		PERCENTAGE		75%	25%	

7) Attach the following supporting materials with the application. Any application that does not contain the following required material will not be considered for funding.

Required:

a) A statement from the authorized signatory of the organization acknowledging and accepting the following:

the organization commits to match 25% of total project cost and acknowledges that funding is provided on a reimbursement basis;

- match funds have been approved and/or appropriated (or are in the process of being approved) by the organization's authorized body;
- the project must be completed by June 30, 2006 in order to receive the grant reimbursement.

b) Letters of support from all organizations identified in the project proposal as participating in the project, and/or providing a portion of the match for the project. These letters must be written on the organization's letterhead, be signed by the municipality's authorized signatory, and must detail the services and/or match to be provided by the organization (RE match: must also document any cash match that has been identified and earmarked for the project). **Letters of support from participating entities must be included with the proposal and not submitted separately.**

c) The following standard forms:

NOTE: All forms must be signed by the organization's/municipality's authorized signatory.

- Commonwealth Standard Terms & Conditions
- Commonwealth Standard Contract
- Contractor Authorized Signature Verification Form
- Northern Ireland Notice and Certification
- Request for Taxpayer Identification Number and Certification (W-9)
- Copy of local bylaw/ordinance documenting the organization's authorized signatory.
- All forms may be obtained electronically via the Operational Services Division (OSD) website on the right hand side under "Related Links", at: http://www.mass.gov/portal/index.jsp?pageID=osdmodulechunk&L=1&L0=Home&sid=Aosd&b=terminalcontent&f=osd_forms&csid=Aosd

Recommended:

a. A statement of support from appropriate local authority(ies) and stakeholder group(s), e.g., Conservation Commission, DPW, watershed organizations, etc.

b. Maps, resource/classification information, and water quality data pertinent to the project.

All forms, letters, and statements are included in this Proposal.

End of application